

App. Serial No 10/550,741
NI.030347US1

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Remarks

Claims 6-14 and 17-20 are currently pending in the patent application. For the reasons and arguments set forth below, Applicant respectfully submits that the claimed invention is allowable over the cited references.

In the instant Office Action dated June 14, 2007, claims 8, 18, and 19 stand rejected under 35 U.S.C. § 112, second paragraph; claims 6-7, 9-10, 13-14, and 17 stand rejected under 35 U.S.C. § 103(a) over Gardner *et al.* (U.S. Patent No. 6,160,300) in view of Tao *et al.* (U.S. Patent No. 6,399,515); claims 11, 12 and 20 stand rejected under U.S.C. § 103(a) over Gardner *et al.* in view of Tao *et al.* as applied to claims 6-7, 9-10, 13-14 and 17 above, and further in view of Sato *et al.* (U.S. Patent No. 5,290,712); and claims 8, 18 and 19 stand rejected under U.S.C. § 103(a) over Gardner *et al.* in view of Tao *et al.* as applied to claims 6-7, 9-10, 13-14 and 17 above, and further in view of Lee *et al.* (U.S. Patent No. 6,172,399)

Regarding the Section 112 (2) rejection of claims 8 and 18-19, Applicant has amended these claims to clarify that an abruptness refers to the abruptness of the doping profile. Applicant notes that this is consistent with the Examiner's interpretation of the claim limitation and also that which would have been understood by one of skill in the art. Thus, Applicant requests that the Section 112 (2) rejection of claims 8 and 18-19 be withdrawn.

Applicant respectfully traverses all of the Section 103(a) rejections of claims 6-14 and 17-20 (each of which relies upon a combination of the Gardner and Tao references) because the combination would not produce a gate layer with optimal conductivity as asserted by the Office Action. "A patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (U.S. 2007). As is consistent with Section 103, the M.P.E.P. and relevant case law, there must be some reason why one of skill in the art would combine the cited teachings. The Office Action asserts that one of skill in the art would have doped Gardner's gate layer 14 to a level of 10^{20} ions/cm³ or greater in order to assure optimal conductivity as taught by Tao. See, e.g., page 3, lines 13-19 of the instant Office Action. However, the Gardner reference teaches the

App. Serial No 10/550,741
NL030347US1

desirability of gate layer 14 having a large grain size (*see, e.g.*, Col. 6:23-50), which (as is indicated in Applicant's specification, *see, e.g.*, paragraphs 0004-0007) creates problems relating to the activation of the dopants during annealing in heavily doped silicon. Thus, Applicant submits that heavily doping Gardner's gate layer 14 would reduce the conductivity of layer 14, not ensure optimal conductivity as asserted by the Office Action. Accordingly, the Office Action fails to present a reason for why one of skill in the art would combine the cited teachings of the Gardner and Tao references. Moreover, the Gardner and Tao references use different processes for creating their respective gate layers, these processes appear to be incompatible with each other. More specifically, Gardner teaches a process involving annealing (*see, e.g.*, Col. 6:23-50), whereas Tao teaches depositing a doped polysilicon material which has not been thermally annealed (*see, e.g.*, Col. 9:23-28). In view of the above, the Section 103(a) rejections of claims 6-14 and 17-20 are improper and Applicant requests that they be withdrawn.

Notwithstanding the above traversal, in an effort to facilitate prosecution, Applicant has amended claim 6. More specifically, claim 6 has been amended to include limitations directed to the grain size of the first layer of gate material being smaller than the grain size of the second layer of gate material. Applicant notes that the cited portions of the Gardner reference teach that the grain size of gate layer 14 is larger than the grain size of gate layer 20. *See, e.g.*, Col. 5:29-33 and Col. 6:43-50. Accordingly, Applicant request that the Section 103(a) rejections of claims 6-14 and 17-20 be withdrawn.

Applicant further traverses the Section 103(a) rejection of claim 12 because the broad range of grain size disclosed by the Sato reference (*i.e.*, 10 angstroms to hundreds of angstroms) is insufficient to anticipate a grain size of less than 5 nm. According to M.P.E.P. § 2131.03 "If the claims are directed to a narrow range, >and< the reference teaches a broad range, ** depending on the other facts of the case, it may be reasonable to conclude that the narrow range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims. **>*See, e.g., Atofina v. Great Lakes Chem. Corp.*, 441 F.3d 991, 999, 78 USPQ2d 1417, 1423 (Fed. Cir. 2006)." The cited portions of the Sato reference do not disclose any further detail regarding why one of skill in the art would choose a grain size of less than 5 nm as in the claimed invention. Moreover, having a grain size of less than 5 nm results in a gate material that has certain desirable

App. Serial No 10/550,741
NL030347US1

properties. *See, e.g.*, Paragraphs 0007 and 0041 of Applicant's specification. Therefore, the Section 103(a) rejection of claim 12 is improper and Applicant request that it be withdrawn.

In view of the remarks above, Applicant believes that each of the rejections has been overcome and the application is in condition for allowance. Should there be any remaining issues that could be readily addressed over the telephone, the Examiner is asked to contact the agent overseeing the application file, Peter Zawilski, of NXP Corporation at (408) 474-9063 (or the undersigned).

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